
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Peter C. Van Buskirk, et al.

Title : ISOTROPIC DRY CLEANING PROCESS FOR NOBLE METAL
INTEGRATED CIRCUIT STRUCTURES

U.S. Serial No.: New Continuation of Prior Copending U.S. Patent Application No.
09/093,291

Prior Application Filing Date: June 8, 1998

Prior Application Group Art Unit: 1746

Prior Application Examiner: A. Olsen

Customer No.: 25559

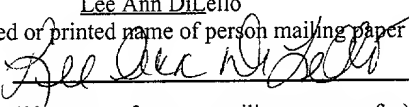
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PRELIMINARY AMENDMENT

Sir:

Prior to examining the instant application on the merits, please amend the
specification as follows:

IN THE SPECIFICATION

Please amend the specification by inserting before the first line the sentence --This is a continuation of U.S. Application No. 09/093,291, filed on June 8, 1998, now pending.--

IN THE CLAIMS

Please cancel claims 1, 5-11, 15-22, 28-51.

Please add the following new claims:

48. A method for removing a noble metal residue comprising iridium, from a microelectronic device structure disposed in a chamber, the method comprising contacting the microelectronic device structure with a cleaning gas comprising gas-phase XeF_2 , wherein the gas phase XeF_2 is continually flowed through the chamber in combination with an energetic dissociation source selected from the group consisting of a plasma source, an ion source, an ultra violet source and a laser source, to at least partially remove the noble metal residue.
49. A method for removing a noble metal residue comprising iridium, from a microelectronic device structure disposed in a chamber, wherein elemental silicon is present, the method comprising evacuating the chamber, filling the chamber with a cleaning gas comprising XeF_2 , and retaining the cleaning gas in the chamber to react with the residue, to effect the removal of the noble metal residue from the microelectronic device structure.
50. A method for removing a noble metal residue comprising iridium, from a microelectronic device structure disposed in a chamber, the method comprising

evacuating the chamber, filling the chamber with a cleaning gas comprising XeF_2 and one or more radicals selected from the group consisting of SiF_2 and SiF_3 , and retaining the cleaning gas in the chamber to react with the residue, to effect the removal of the noble metal residue from the microelectronic device structure.

51. A method for removing from a microelectronic device structure a noble metal residue including at least one metal selected from the group consisting of platinum, palladium, iridium and rhodium, the method comprising contacting the microelectronic device structure with a gas-phase reactive halide composition comprising SiF_4 , to remove the residue.
52. A method for removing from a microelectronic device structure a noble metal residue including at least one metal selected from the group consisting of platinum, palladium, iridium and rhodium, the method comprising contacting the microelectronic device structure with a gas-phase reactive halide composition comprising Si_2F_6 , to remove the residue.
53. A method for removing from a microelectronic device structure a noble metal residue including at least one metal selected from the group consisting of platinum, palladium, iridium and rhodium, the method comprising contacting the microelectronic device structure with a gas-phase reactive halide composition:
 - (a) comprising a halide component selected from the group consisting of SF_6 , SiF_4 , Si_2F_6 , SiF_2 radical, SiF_3 radical, and XeF_2 , in an amount effective to at least partially remove the residue; and

(b) lacking a nitrogen- or phosphorous-containing π -acceptor ligand.

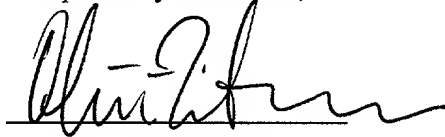
REMARKS

This is a continuation of application serial no. 09/093,291, now allowed.

An early examination on the merits is earnestly solicited.

Date: January 24, 2001

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Oliver A.M. Zitzmann", written over a horizontal line.

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